

**Deer Park Fire
Water and Released Material Sampling Plan
Draft April 14, 2019**

1.0 INCIDENT SUMMARY

On Sunday, March 17, 2019, a fire broke out at Intercontinental Terminals Company LLC (ITC) resulting in materials being released to the water. This Plan describes sample collection procedures for (a) residual firefighting foam from totes (b) released material and (c) water samples.

2.0 PURPOSE AND OBJECTIVES

Collecting samples of (a) residual firefighting foam from totes (b) released material and (c) water is intended to provide information that may be useful in guiding clean-up actions.

Sampling objectives include, but are not limited to:

- Defining the spatial and temporal extent of released material transport;
- Documenting the chemical composition of firefighting foam in totes; and
- Documenting the chemical composition of material released to waters beyond Tucker Bayou.

This plan does not address sampling of residual material from tanks which will be scheduled when conditions allow.

3.0 HEALTH AND SAFETY

Safety is the most important consideration when implementing this plan. All field team members will read the incident-specific site health and safety plan (HASP) and receive a daily safety briefing before going into the field. A daily tailgate safety meeting must be held prior to any field work and a written record of the daily tailgate safety meeting, including signatures of all personnel present, will be maintained.

Field team members collecting samples by boat will receive a boat safety briefing by the boat operator prior to leaving the launch area. When on the water, field team members will wear personal flotation devices at all times. Good judgment must be used, particularly when considering fieldwork during inclement weather and/or in the vicinity of other marine traffic particularly heavy shipping. No sampling will be conducted in the dark. While working on the shoreline, field team members should be mindful of slippery surfaces (e.g., rocks) and sharp objects. Field team members should wear safety glasses, sunscreen, appropriate footwear (safety toe), and other personal protective equipment (PPE) as required by the Safety Officer. Any incident will be promptly reported to the Environmental Unit Lead, who will notify Incident Command.

When collecting samples in impacted areas, field sampling team members will wear appropriate protective equipment (e.g., FRCs) as needed. When sampling for PFAS, field staff should NOT wear any waterproof clothing, waterproof footwear, or Tyvek. Field crews should also stay away from waterproof paper and plastic clipboards to minimize potential cross-contamination. Nitrile gloves will be worn when sampling and must be changed between each sampling site.

The sample containers for benzene, toluene, ethylbenzene, and xylene (BTEX) analyses contain acid (HCL) as a preservative, which may be harmful to sampling personnel. Extra care must be taken to prevent worker exposure to these preservatives and loss of the preservatives during sample collection.

Wet sampling supplies become slippery and can easily be dropped. It is recommended that at least one spare bottle for each analysis type be kept with a sample team at all times as ready replacements for equipment that could potentially become contaminated during sampling.

4.0 SAMPLING

The sampling team will document field-derived information, observations, and other field data in field logbooks. Information in the logbook should include sampling details (i.e., field team members, sampler name, sample type, location (GPS coordinates, and time/date) and other observations (i.e., presence of wildlife and humans, visual observations, weather). Photographs or videos should be taken of the sampling site.

The remainder of Section 4 describes general methods for collecting samples. Sample handling and chain of custody methods are described in Section 5.0. Potential laboratory analyses, required sample volumes, sample containers, and preservation methods are described in Section 6.0. Quality Control (QC) is described in Section 7.0.

4.1 Sampling Source Fire Suppression Material

Fire suppression material samples will be collected directly from totes that include the source material when they are moved out of the hot zone. Sampling will be initiated after an inventory of the totes used during the incident is complete. The goal will be to sample each type of firefighting foam that may contain PFOS.

Sample collection will be coordinated with ITC operations personnel through the Environmental Unit Lead as totes are still in the hot and warm zones. Appropriate health and safety precautions will be followed, including use of required PPE.

Prior to collecting samples, record date, time, source (e.g., tote ID, company, etc.), type of sample, and location (GPS coordinates). Collect photos of area and tote during sample collection as feasible and permissible.

Source fire suppression material will be collected in pre-cleaned bottleware, obtained from the laboratory. Appropriate bottleware will be directly filled with unused fire suppression material. If gloves come into contact with the source sample, change gloves and take another sample. Change gloves between each sample.

Mark the label using the following nomenclature:

Matrix-YYYYMMDD-location-Replicate-Team

Ex. FM-20190322-OPPT2-001-T1

Immediately place samples in ice chest with wet ice, or place the samples in a refrigerator until they can be shipped. PFAS samples should never come into contact with blue ice. Keep source sample(s) separate from other samples at all times.

Samples will be shipped, under proper chain of custody (COC), to ALS Laboratory¹ in Kelso, Washington². Samples of fire suppression materials should be shipped separately from all other environmental samples.

4.2 Sampling Released Material

Released material samples will be opportunistically collected if material is encountered during sampling activities. Appropriate health and safety precautions will be followed, including use of required PPE. Prior to collecting samples, record date, time, type of sample/appearance of material, and location (GPS coordinates). Collect photos of area where sample is being collected.

Released material samples will be collected in pre-cleaned bottlenecks, obtained from the laboratory. Appropriate bottlenecks will be filled with released product taking care to avoid collection of water. If gloves come into contact with the source sample, change gloves and take another sample. Change gloves between each sample.

Mark the label using the following nomenclature:

Matrix-YYYYMMDD-Location-Replicate-Team

Ex. PR-20190322-OPPT2-001-T2

Immediately place samples on wet ice. Samples should never come into contact with blue ice. Keep released material sample(s) separate from other samples at all times.

Samples will be shipped, under COC, to ALS Kelso, Washington. Released material samples should be shipped separately from all other environmental samples.

4.3 Sampling Water

Since shortly after the initial fire, ITC, at request of TCEQ, has been collecting regular water samples from outfall 003; in the restricted access zone between the tankfarm and Tucker Bayou. Those data are being provided to the Unified Command and the public on a regular basis and are not the subject of this plan. Likewise, outfall 002 is currently in the restricted zone and is not part of this plan.

This plan addresses surface water sampling in Buffalo Bayou and areas up and downstream from Buffalo Bayou (Table 4-1 and Figure 4-1). Depending on field conditions and logistical considerations, further sampling locations may be added.

Figure 4-1 Sampling Locations

¹ ALS Laboratory in Kelso is a NELAC -accredited and Texas certified laboratory (# T104704427).

² ALS Global, 1317 S. 13th Ave., Kelso, WA 98626

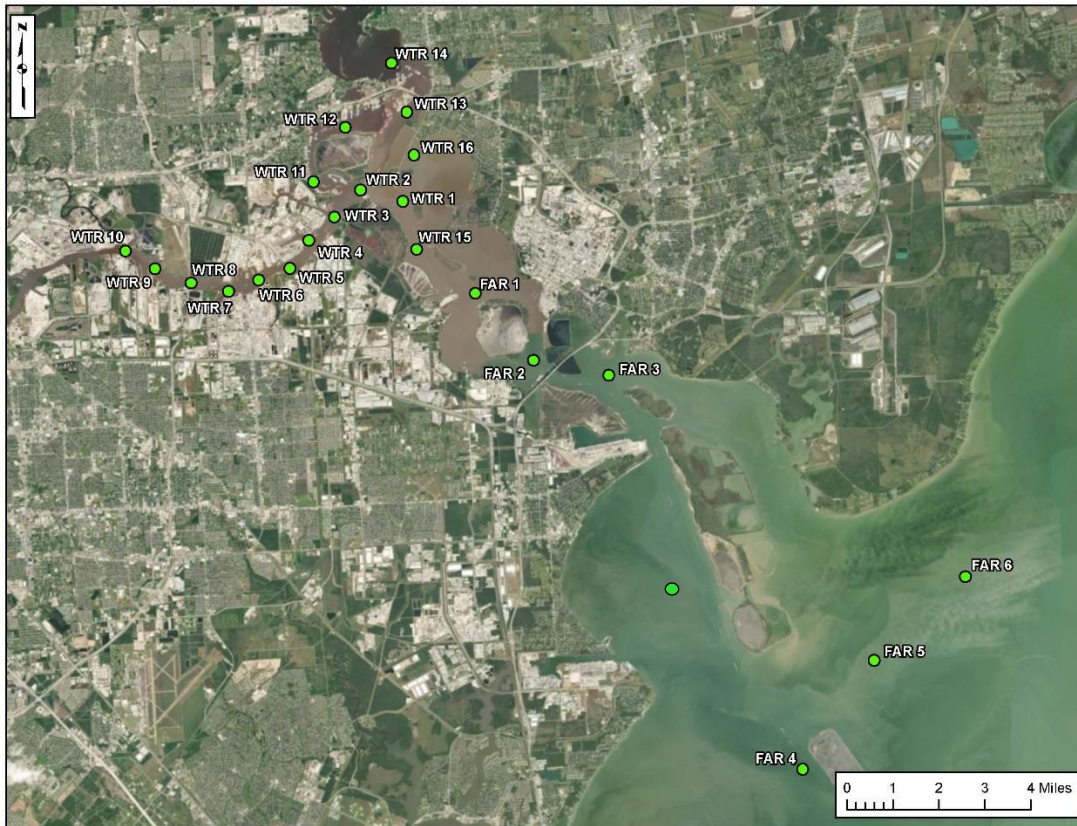


Table 4-1 Sampling Locations

Name	Latitude	Longitude
Water 1	29.759221	-95.067987
Water 2	29.763276	-95.083139
Water 3	29.754971	-95.092929
Water 4	29.747843	-95.102444
Water 5	29.739321	-95.109662
Water 6	29.735982	-95.121056
Water 7	29.732706	-95.132049
Water 8	29.735670	-95.145481
Water 9	29.740608	-95.158351
Water 10	29.746453	-95.168766
Water 11	29.766314	-95.100014
Water 12	29.783064	-95.087790
Water 13	29.787265	-95.065423
Water 14	29.802878	-95.070377
Water 15	29.743952	-95.063512
Water 16	29.773681	-95.063420
Farfield 1	29.729426	-95.042841
Farfield 2	29.707780	-95.022771
Farfield 3	29.702289	-94.995626
Farfield 4	29.576069	-94.930614
Farfield 5	29.634915	-94.869519
Farfield 6	29.609615	-94.903418
Farfield 7	29.65428	-94.99974

Appropriate health and safety precautions will be followed, including use of required PPE. Prior to collecting samples, record date, time, source (e.g., tote ID, company, etc.), type of sample, and location (GPS coordinates). Collect photos of area and tote during sample collection as feasible and permissible.

Prior to collecting surface water samples, visible foam or material on the water surface should be moved aside with a water hose, compressed air, or paddle. Care should be taken not to disperse product into the water column. Avoid sampling downwind of solvents or engine exhaust. This is usually avoided by approaching the sampling location into the wind and current if practical.

Water samples will be collected in pre-cleaned bottleware, obtained from the laboratory. Surface water samples will be collected by hand. Sub-surface water will be collected with a decontaminated 8 foot pole sampler. Decontamination consists of a Liquinox wash, distilled water rinse, and a final rinse with deionized water.

After collecting samples, seal the sample containers, label, and immediately place in an ice chest with wet ice. Label sample jars using the following nomenclature,

Matrix-YYMMDD-Location Code-Replicate-Team Number

Sub-surface Ex. SSWT-20190322-WTR1-001 T1

Water samples will be, shipped under proper COC, to ALS in Kelso, WA. Environmental samples should be shipped separately from firefighting foam and released material samples.

5.0 SAMPLE HANDLING AND SAMPLE CUSTODY

Sample containers and preservatives will be provided by the laboratory. Samples will be placed in individual pre-cleaned containers for shipment to the laboratory. Samples will be collected and stored in accordance with EPA SW-846–Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. (See SW-846 Chapters 1, 2, 9, and 11 for descriptions of accepted sampling methods, plans, QA/QC and relevant procedures). With prior approval through UC, or in cases where the ASTM method is specified in regulations, ASTM methods will be used. In cases where guidance does not exist for specific constituents, sampling will be done in a manner consistent with laboratory instructions. Field personnel will keep samples cold by placing wet ice in the coolers in which samples will be stored until delivery to the analytical laboratory.

A COC record will be utilized to maintain the integrity of the samples during the collection, storage, and transportation of samples. COC forms should accompany field samples at all times. When transferring possession of the samples, the individuals relinquishing and receiving the samples should sign, date, and note the time of transfer on the COC form. Samples should remain in the physical possession of the person assigned to the samples until they are transferred to another individual or shipped to the laboratory.

6.0 LABORATORY ANALYSES

Section 6 summarizes the potential laboratory analyses, required sample volumes, sample containers, and preservation methods for each sample type. Laboratory analyses may be modified during the course of sampling and will be approved by the environmental unit lead prior to proceeding with any changes.

Source fire suppression material samples will initially be archived. A PFAS analysis may be conducted as needed. Table 6-1 summarizes the laboratory analyses, required sample volumes, appropriate sample containers, preservation methods, and holding times for source fire suppression material samples.

Table 6-1 Source and Released Fire Suppression Material Sample Analyses

Analyte	Test Method ¹	Sample Volume and Containers ^{2, 3}	Preservation	Sample Holding Time ⁴
PFAS	537.1	Teflon-free high density polyethylene	Cool 4 °C	28 days

¹ Additional test methods may be used that are specific for the analytical laboratory, media/oil type, or as required by regulatory agency.

² Sample size excludes volumes for QA/QC analyses (i.e., replicate sample analyses). It is recommended that all samples be collected in duplicate containers in case of breakage during storage, transport or shipping. (Additional volumes required for collecting samples in duplicate containers are not included).

³ Oil samples and any samples containing oil should be collected in vials with hard caps only. Soft septum caps should not be used, as the oil may leak and could compromise all samples in the same shipping container.

⁴ Sample holding times are not applicable to oil samples.

Samples of released material will initially be archived.

- Samples that appear to include foam will be collected in certified Teflon free 250 ml poly bottles.
- Samples that appear to be primarily petroleum based will be collected in an unpreserved amber and material will be decanted into a 45 ml unpreserved VOA vile.
- In some instances, both certified Teflon free 250 ml poly and 45 ml unpreserved VOA samples may be collected.

Potential analysis will be identified after reviewing Safety Data Sheets and water sampling results.

Water samples will be analyzed for PFAS (surface water only), alkylated polycyclic aromatic hydrocarbons (PAHs), BTEX, and metals (surface water only).

Table 6-2 Laboratory Analyses for Water Samples

Analyte	Test Method ¹	Sample Volume and Containers ²	Preservation	Sample Holding Time ³
Alk PAH	SW846-8270D SIM	Two 1-L amber glass; Teflon-lined cap	4 °C	7 days to extract; 40 days for extract
BTEX	SW846-8260C	Three 40 mL glass vials, Teflon-lined septum	No headspace, HCl, 4 °	14 days
Metals*	SW846-6010	500 mL HDPE	HNO ₃	6 months
PFAS*	537M	Teflon-free HDPE	4 °C	28 days

¹ Additional test methods may be used that are specific for the analytical laboratory, media/oil type, or as required by regulatory agency.

² Sample size excludes volumes for QA/QC analyses (i.e., replicate sample analyses). It is recommended that all samples be collected in duplicate containers in case of breakage during storage, transport or shipping. (Additional volumes required for collecting samples in duplicate containers are not included).

³ Sample holding time before extraction.

* Sub-surface samples not analyzed for these parameters.

7.0 QUALITY CONTROL SAMPLES

The sampling coordinator will coordinate with the laboratory prior to sampling to ensure that the appropriate analytical methods and detection limits are used (i.e., detection limits will be below proposed benchmarks), consistent with TCEQ's Quality Assurance Project Plan (QAPP) and SW-846. Additional samples will be collected for quality assurance/quality control (QA/QC) purposes. QC samples will include trip blanks, field blanks, field duplicates, and Matrix Spike/Matrix Spike Duplicates (MS/MSD). Trip blanks will be provided by the laboratory, at a frequency of one per cooler containing samples submitted for BTEX and/or PFAS analysis, must contain deionized water, and will accompany sample containers into the field and be returned to the laboratory without being opened. Field blanks will be samples of DI water that are transferred from original container to empty container while in the field, only newly filled bottles need to be sent back to the lab. Field duplicate samples will be collected for water and will be submitted to the laboratory "blind." MS/MSD samples are triplicate volume which includes the original sample. Field duplicates and MS/MSD samples will be collected at a rate of 1 per 20 field samples and field blanks will be collected once per sampling day. In this case, only one will be required per sample mission. All QC samples will be analyzed for the same laboratory parameters as field samples.

8.0 DATA QUALITY ASSURANCE

As part of the Quality Assurance/Control (QA/QC) process, a standardized process consistent with TCEQ's Quality Assurance Project Plan (QAPP) and/or SW-846 will be established for collecting, reviewing, and tracking field data and sample custody information recorded during field sampling activities, and uploading this information into a project database and/or centralized project records (e.g., electronic filing system). Incorporation of these data management tools is important for assembling the required information in a timely manner and will aid in on-going data reporting efforts.

An important principle, applicable to all data and documents collected and prepared, is that they are potential evidence in legal matters of considerable importance to many parties. As such, they must be correctly, completely, and accurately recorded in a timely manner, and fully safeguarded.

9.0 ROLES AND RESPONSIBILITIES

Sampling Team Points of Contact from Cardno:

On-site

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Additional sampling may be conducted by ITC, EPA, or TCEQ.

10.0 REFERENCES

EPA. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015).

TCEQ Quality Assurance Project Plan For Environmental Monitoring and Measurement Activities Relating to the Resource Conservation and Recovery Act (RCRA) & Underground Injection Control (UIC) (2019)